

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE CLAIMS

Claims 1 and 39 have been amended to recite that the second detection electrode comprises a conductive case member that surrounds the sensor array, as formerly recited in (now canceled) claim 8.

Claims 1 and 39 have also been amended to clarify that the counter electrode is provided at a lower side of the first detection electrode, as supported by the disclosure throughout the specification and drawings. For example, the drain lines 103 and drain electrodes 112 may serve as the counter electrode, and are provided below the transparent electrode layer 120 which may serve as the first detection electrode. See Fig. 10.

Still further, claim 1 has been amended to more positively recite a detecting circuit for detecting a third signal waveform excited to the second detection electrode upon contact of the detecting object with both the first detection electrode and the second electrode. See Figs. 1 and 5, for example.

The claims have also been amended to make some clarifying amendments, including some minor grammatical improvements and

corrections of some minor antecedent basis problems, so as to put them in better form for issuance in a U.S. patent.

The objections to the claims set forth in items 1-4 on pages 2 and 3 of the Office Action, and the rejections of the claims under 35 USC 112, second paragraph, set forth in items 11-13 on pages 5 and 6 of the Office Action have been addressed.

With respect to the rejections under 35 USC 112, first paragraph, the Examiner asserts that the specification does not enable the full scope of claims 29 and 32-34. See items 6-9 on pages 3 and 4 of the Office Action. However, the Examiner has not provided any analysis or reasoning to support the rejection under 35 USC 112, first paragraph. Accordingly, it is respectfully submitted that a *prima facie* case of lack of enablement has not been established (see MPEP 2164.04, for example).

Nevertheless, in order to advance prosecution, claim 29 has been amended to recite that the time constant, is set to a value in a range of 0.2 to 0.3 μ sec. In addition, claim 32 has been amended to recite that the time constant is set to a value in a range of 0.2 to 0.25 μ sec. Still further, claim 33 has been amended to recite that the resistance component has a sheet resistance having a value of 30 Ω . And claim 34 has been amended to recite that the capacitance component has a capacitance having

a value set to approximately 7 to 10 nF. See, for example Table 1 on page 47 with respect to amended claims 29 and 32-34.

No new matter has been added, and it is respectfully requested that the amendments to the claims be approved and entered. It is respectfully submitted, moreover, that the claims are in full compliance with the requirements of 35 USC 112, and it is respectfully requested that the rejections thereunder be withdrawn.

THE PRIOR ART REJECTION

Claims 1-28 and 39-44 were rejected under 35 USC 103 as being obvious in view of the combination of US 2001/0030324 ("Morikawa et al") and USP 5,828,773 ("Setlak et al"); claims 29-37 were rejected under 35 USC 103 as being obvious in view of the combination of Morikawa et al, Setlak et al and US 2002/0014530 ("Iihama"); and claim 38 was rejected under 35 USC 103 as being obvious in view of the combination of Morikawa et al, Setlak et al, Iihama and USP 6,240,199 ("Manchanda et al"). These rejections, however, are respectfully traversed with respect to the claims as amended hereinabove.

Amended independent claim 1 recites an image reading apparatus comprising: a detecting surface adapted to have a detecting object placed thereon; a sensor array comprising a plurality of sensors arranged to read an image pattern of the

detecting object placed on the detecting surface; a first detection electrode, which is provided at least on an upper portion of the sensor array, and which comprises the detecting surface; and a second detection electrode which comprises a conductive case member that surrounds around the sensor array, the second detection electrode being electrically insulated and spaced apart from the first detection electrode.

In addition, according to amended independent claim 1, the apparatus comprises: a counter electrode which is provided at a lower side of the first detection electrode that is on an opposite side of the first detection electrode from the detecting surface, the counter electrode being opposite to the lower side of the first detection electrode with an interlayer insulating film provided therebetween; and a signal voltage applying circuit which applies a signal voltage having a first signal waveform that varies periodically to the counter electrode to excite a second signal waveform to the first detection electrode through the interlayer insulating film.

Still further, according to amended independent claim 1, the apparatus comprise a contact detector which comprises a detecting circuit for detecting a third signal waveform excited to the second detection electrode upon contact of the detecting object with both the first detection electrode and the second electrode, the contact detector determining whether the detecting object

brought into contact with the detecting surface is a specific detecting object based on a voltage level of the third signal waveform.

Amended independent claim 39 recites a driving method for driving an image reading apparatus including a sensor array having a detecting surface on which a detecting object is placed and a drive controller which reads an image pattern of the detecting object placed on the detecting surface.

According to amended independent claim 39, the method comprises: applying a signal voltage having a first signal waveform that varies periodically to a counter electrode which is provided on an upper portion of the sensor array such that the counter electrode is provided at a lower side of a first detection electrode which comprises the detection surface at an upper side thereof with an interlayer insulating film provided between the counter electrode and the first detection electrode, to excite a second signal waveform to the first detection electrode.

In addition, according to amended independent claim 39, the method comprises detecting a third signal waveform, which is excited to a second detection electrode upon contact of the detecting object with both the first detection electrode and the second detection electrode, the second signal electrode comprising a conductive case member that surrounds around the

sensor array being electrically insulated and spaced apart from the first detection electrode.

Still further, according to amended independent claim 39, the method comprises determining whether the detecting object brought into contact the detecting surface is a specific detecting object based on a voltage level value of the detected third signal waveform; and starting reading of the image pattern by the drive controller when it is determined that the detecting object is the specific detecting object.

As recognized by the Examiner, Morikawa et al discloses a structure for detecting human finger contact on a sensor array. More specifically, as recognized by the Examiner, Morikawa et al discloses a contact sensing electrode 31. As also recognized by the Examiner, the contact sensing electrode 31 of Morikawa et al is formed by two rectangular electrodes (electrodes 31a and 31b) which are separated by a slit 231 as shown in Figs. 43 and 44. When a finger touches both the electrodes 31a and 31b according to Morikawa et al, a change in impedance is detected based on a change in resistance or capacitance between the electrodes 31a and 31b (paragraph [0277]).

The contact sensing electrode 31 of Morikawa et al is provided on a sensor area and therefore may be considered to partially correspond to the first detection electrode recited in claims 1 and 39.

However, according to claims 1 and 39, the second detection electrode comprises a conductive case member that surrounds the sensor array, and the second detection electrode is electrically insulated and spaced apart from the first detection electrode.

It is respectfully submitted that in contrast to the conductive case member which surrounds the sensor array according to claims 1 and 39, Morikawa et al merely discloses two sheets of rectangular electrodes 31a and 31b provided on respective portions of a sensor array.

It is respectfully submitted that neither of the electrodes 31a and 31b of Morikawa et al is a conductive case member, and it is respectfully that neither of the electrodes 31a and 31b of Morikawa et al surrounds the sensor array.

And it is respectfully submitted that Morikawa et al does not disclose, teach or suggest a second detection electrode as recited in amended independent claims 1 and 39.

It is noted that the Examiner has cited Fig. 47 of Morikawa et al as disclosing a second detection electrode which surrounds the sensory array. This figure of Morikawa et al shows electrode 31a covering the sensor area, and it is respectfully pointed out that according to the Examiner, electrode 31a of Morikawa et al is the first (not the second) detection electrode recited in claims 1 and 39. See page 7 of the Office Action.

It is respectfully pointed out, moreover, that in the Examiner's interpretation of Fig. 47 of Morikawa et al, if electrode 31a is considered to be the second detection electrode of claims 1 and 39, then electrode 31b must be considered by the Examiner to be the first detection electrode of claims 1 and 39. However, according to claims 1 and 39, the first detection electrode is provided on at least an upper portion of the sensor array and the first detection electrode comprises the detecting surface (on which an object is placed to have the image pattern of the read). By contrast, according to Fig. 47 of Morikawa et al, the electrode 31b is not provided on the sensor array (because the electrode 31a covers all of the sensor array as described in paragraph [0286] of Morikawa et al).

In other words, even if, Fig. 47 of Morikawa et al could reasonably be considered as disclosing the structure of the second detection electrode of claims 1 and 39, the first detection electrode of claims 1 and 39 would then not be disclosed or suggested.

Thus, it is respectfully submitted that Morikawa et al does not reasonably suggest the combination of the first and second detection electrodes having the structure recited in amended independent claims 1 and 39.

It is respectfully pointed out, moreover, that Morikawa et al discloses detecting finger contact by applying an alternate

current signal to the layer 31 and detecting a change in impedance of the layer 31 caused by a finger contacting layer 31.

By contrast, according to amended independent claims 1 and 39, when a second signal waveform is excited to the first detection electrode, a third signal waveform is excited to the second detection electrode upon contact of the detecting object with both the first detection electrode and the second electrode (which are spaced apart from each other). Then, the whether the specific detecting object has contacted the detection surface is determined based on a voltage level of the third signal waveform.

It is respectfully submitted that this detection performed with the structure of claim 1 and the method fo claim 39 differs from detecting a change in impedance of an electrode to which a signal is directly applied, as disclosed by Morikawa et al.

Setlak et al discloses a fingerprint sensor 30 including: a substrate 65; a ground plane electrode layer 68; a metal layer 71 positioned over the ground plane electrode layer 68 with a dielectric layer 70 therebetween; a plurality of sensing elements 30a arranged in array pattern on the upper surface of an insulating layer 76, which is provided on the metal layer 71; a dielectric layer 52 provided on the insulating layer 76; a surface electrode 54 provided around the periphery of the dielectric layer 52; and a package 51, wherein a finger 79 can contact the dielectric layer 52 and the surface electrode 54.

According to Setlak et al, the surface electrode 54 is connected to the ground plane electrode layer 68 so that it is at ground potential. A signal in the range of 1 KHz to 1 MHz is applied from an excitation drive amplifier 74 to the metal layer 71. The sensing elements 30a have a sensing electrode 78 and an annularly shaped shield electrode 80 surrounding the sensing electrode 78 and spaced therefrom, whereby a change to signal occurring to the sensing electrode 78 is detected so as to read the fingerprint.

By contrast, according to amended independent claims 1 and 39, the second electrode is provided as an electrode for detecting contact of a detecting object. According to amended independent claims 1 and 39, the second detection electrode is spaced from the first detection electrode, which comprises a detecting surface for reading an image pattern, and the second detection electrode comprises a conductive case member that surrounds around a sensor array. It is respectfully submitted, by contrast, that according to Setlak et al, the sensing electrode 78 is an electrode for fingerprint reading, and it is respectfully submitted that Setlak et al does not disclose or suggest the second detection electrode as recited in amended independent claims 1 and 39.

In a configuration of Setlak et al, a signal in the range of 1 KHz to 1 MHz is applied from the excitation drive

amplifier 74 to the sensing electrode 78 through the metal layer 71 and the insulating layer 76, and a signal in response thereto is always excited. In this configuration for fingerprint detection, upon the finger 79 contacting the surface electrode 54 at ground potential, the finger 79 is also connected to ground potential and then placed on the sensing electrode 78 through the dielectric layer 52. The electric field changes accordingly, and a signal excited to the sensing electrode 78 in turn changes, based on which the fingerprint of the finger 79 is detected.

By contrast, according to amended independent claims 1 and 39, upon contact of the detecting object with both the first and second detection electrodes, these electrodes are connected such that a part of a signal excited to the first detection electrode is propagated to the second detection electrode so that a signal being excited to the second detection electrode changes. It is respectfully submitted that Setlak et al does not disclose, teach or suggest this structure and method for detecting a detecting object as recited in amended independent claims 1 and 39.

According to amended independent claims 1 and 39, moreover, it is determined whether the detecting object brought into contact is a specific detecting object based on a voltage level value of a third signal waveform excited to the second detection electrode upon contact of the detecting object. By contrast, it

is respectfully submitted that Setlak et al merely describes detecting the fingerprint of the finger 79 based on signals to the sensing electrode 78.

It is respectfully submitted that, Setlak et al also does not disclose or suggest the structure and method for detecting the contacting of a detecting object and for determining whether the detecting object is a specific detecting object, as recited in amended independent claims 1 and 39.

Accordingly, it is respectfully submitted that even if Morikawa et al and Setlak et al were combinable as suggested by the Examiner, amended independent claims 1 and 39 still would not be achieved or rendered obvious.

In view of the foregoing, it is respectfully submitted that the present invention as recited in amended independent claims 1 and 39, as well as claims 2-7 and 9-38 depending from claim 1 and claims 40-44 depending from claim 39 clearly patentably distinguish over Morikawa et al, Setlak et al, Iihama and Manchanda et al, taken in any combination under 35 USC 103.

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Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

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